

Work Order ID 59028

Tuesday, May 25, 2010 8:21:52 AM

Page 1

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Item Name: Replacement Skidtube

Stop



Start Date: 5/25/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 6/10/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

*PH*Date: *10-5-25* Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Draw Nbr

Revision Nbr

D2580

Rev D

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

N/A

110

0.00



BENDING MACHINE - SKIDTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio FT009

2-Cut tubes as per Dwg. D2580

h 10/5/26

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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Tooling: _____

Date: _____

Run Start



QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

120

0.00



Skidtubes

Memo

0.00

Skidtubes

1- Deburr ends

2- C'sink holes as per dwg without cutting fluid

3- Prepare tube for welding, remove alodine as required.

4- Scribe batch number insied aft end of tube.

H12/5/26

130

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

① Ø BE 10/05/28

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

140

0.00



Skidtubes

Memo

0.00

Skidtubes

1-Weld step D2576 as per Dwg. D2580 and QSI 004

A/R□□□ Aluminum Rod

M112860

BE 10/05/31

2-Prep per QSI 005 and weld crossbolt spacers D2579 as per Dwg. D2580, QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill

A/R□□□ Aluminum Rod

M112860

BE 10/05/31

3-Grind welds as per Dwg D2580 Grind flush ridge made from bending

BE 10/06/01

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Deburr

BE 10/06/01

5-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580. Deburr holes

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Deburr

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Deburr

M 10/5/1

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150

QC10- Inspect visual per QSI004- ground welds

0.00



QC

Memo

0.00

Quality Control

8.0/06/01

160

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

8.0/06/01

④

170

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.

1 BK 106-1

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 Powdercoat Powder Coating	White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum Memo START TIME: 7:45am OVEN TEMPERATURE: 320°C FINISH TIME: 8:15am	0.00 0.00	1114207 =2 JB 10/06/01			1	Ø		
190 QC Quality Control	QC3- Inspect Part Finish Memo	0.00 0.00							1 BR 10-6-3

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Page 6

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

0.00



HandFinish

Memo

0.00

Hand Finishing

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of
Sikaflex on insert holes before installing wearplates
A/R ☐ ☐ ☐ Sikaflex-291 ☐ 11/3435
Sikaflex expire date: 10/11

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as
per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with
Sikaflex. Clean excess adhesive
A/R ☐ ☐ ☐ Sikaflex-291 ☐ 11/3435
Sikaflex expire date: 10/11

5-Wing Walk as per Dwg D2580 and QSI 005 4.4
Batch: 11/132

① BR 10-6-4.

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Page 7

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Customer:

Reference:

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

S. 10/06/04

(40)

Quality Control

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

220

Packaging

0.00



Packaging

Memo

0.00

Identify and pack for shipping as per PPPD205-634-041

Location: _____

PPP Rev: _____

PDP 59001

PDP 10/06/04

230

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

10/06/17

YMF

10-6-16

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Required Date: 6/10/2010

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ
IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD
IPP Rev. O 06.02.28 Added paperwork EC
IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Qty: 1.00

Required Qty: 1.00

D2580-1

Manufactured No

110

Each

7.0000

1

1



205 Skidtube bent detail



358747 D H 10/5/26

Location

Loc Qty

Loc Code

LG

7

57028

1

58384

1

58385

1

58618

2

58619

2

D2576-3

Manufactured No

140

Each

101.0000

1

1



Step (maching detail)



Location

Loc Qty

Loc Code

LG

101

46661

53

52215

48

D2579

Manufactured No

140

Each

13.0000

20

20



Crossbolt Spacer



Location

Loc Qty

Loc Code

LG

13

57052

5

57348

8

B 58433

(20)

BE 10/05/31

W/O:		WORK ORDER CHANGES					
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Start Date: 5/25/2010

Required Date: 6/10/2010

Start Qty: 1.00

Required Qty: 1.00

D2855

Manufactured No

200

Each

99.0000

1

1



Cap

Location

Loc Qty

Loc Code

FP6

2

56613

2

ST026

97

50513

1

50770

28

51539 ✓

15

53791

53

1 BR 10-6-4

AN3-5A

Purchased

No

200

Each

951.0000

2

2



Bolt

Location

Loc Qty

Loc Code

ST350

951

105057 ✓

951

2 BR 10-6-4

AN960JD10L

NAS1149D0332J

Purchased

No

200

Each

4,013.000

2

2



Washer

Location

Loc Qty

Loc Code

ST348

4013

110985 ✓

4013

2 BR 10-6-4.

ALS7-1032-130

Purchased

No

200

Each

17.0000

50

50



Insert

Location

Loc Qty

Loc Code

ST282

17

113238

17

50. BR 10-6-4.

ALS4-1032-130

Tuesday, May 25, 2010 8:21:57 AM

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Page 2

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 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Qty: 1.00

Required Qty: 1.00

AN3C4A	Purchased	No	200	Each	1,239.000	50	50
BOLT							

Location	Loc Qty	Loc Code
ST350	1239	
114103	501	
114108 ✓	300	
114416	12	
114523	426	

50 BR 10-6-4

AN960C10L	NAS1149C0332 R	Purchased	No	200	Each	0.0000	50	50
washer								

NAS1149C0332R 114341

50 BR 10-6-4

D3566-13		Manufactured	No	200	Each	27.0000	1	1
Gasket								

Location	Loc Qty	Loc Code
FP	27	
53461 ✓	27	

1 BR 10-6-4

D3566-5		Manufactured	No	200	Each	15.0000	1	1
Gasket								

Location	Loc Qty	Loc Code
FP015	15	
57682 ✓	15	

1 BR 10-6-4

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IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Qty: 1.00

Required Qty: 1.00

D3566-1	Manufactured	No	200	Each	29.0000	2	2
Gasket							
		<u>Location</u>		<u>Loc Qty</u>	<u>Loc Code</u>		
		FP015		29			
		57715		8			
		58182 ✓		21			
D3564-11	Manufactured	No	200	Each	3.0000	1	1
Wearshoe							
		<u>Location</u>		<u>Loc Qty</u>	<u>Loc Code</u>		
		FP019		3			
		57957		3			
D3564-13	Manufactured	No	200	Each	21.0000	1	1
Wearshoe							
		<u>Location</u>		<u>Loc Qty</u>	<u>Loc Code</u>		
		FP17		21			
		57684		7			
		57922 ✓		14			
D3564-9	Manufactured	No	200	Each	16.0000	1	1
Wearshoe							
		<u>Location</u>		<u>Loc Qty</u>	<u>Loc Code</u>		
		FP		1			
		55334		1			
		FP019		15			
		57685		1			
		57958 ✓		14			

2 BR 10-6-4

1 BR 10-6-4

1 BR 10-6-4

1 BR 10-6-4

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 IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Start Qty: 1.00

Required Qty: 1.00

D3564-5 Manufactured No 200 Each 23.0000 1 1
 Wearshoe

Location	Loc Qty	Loc Code
FG	1	
34806	1	
FP19	22	
57525	1	
58709 ✓	21	

D2594-3 Manufactured No 200 Each 311.0000 16 16
 O-Ring, 205 Skidtube

Location	Loc Qty	Loc Code
FP	311	
55546	19	
58191 ✓	292	

D2594-1 Manufactured No 200 Each 486.0000 16 16
 Plug, 205 Skidtube

Location	Loc Qty	Loc Code
FP	318	
42807	112	
55002	71	
57826 ✓	135	
FP14	168	
58434	168	

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DART

DESIGN #	DRAWN BY RH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED #	APPROVED #	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

RELEASED
07.06.28 #

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

SHOP COPY
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ENGINEERING
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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 59028

BS 10-5-25

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
SEE NOTES ON
PAGE 2 FOR D2580-041 AND
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Diagram illustrating the grinding locations for the propeller cross-section. The diagram shows a cross-section of a propeller with the following labeled areas:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- GRIND FLUSH
- LOCATION RIDGE ON UNDERSIDE OF D2576

Diagram illustrating the assembly of a bolted joint. The components and dimensions are labeled as follows:

- DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)
- #0.208
- SEAL WITH SIKAFLEX-241/-291
- AN3-5A BOLT (1)
- AN960J10L WASHER (1)
- (2 PLACES)
- D2855 CAP
- 0.40

Diagram illustrating the assembly of the D2579 Spacer. The assembly consists of a central web (D2596 WEB (REF)) and a spacer (D2579 SPACER). The spacer is shown with a central hole and two side holes. The web is shown with a central hole and two side holes. The assembly is shown with the spacer and web joined together.

Labels in the diagram:

- D2579 SPACER
- D2596 WEB (REF)
- ALS7-1032-130 (REF) (TYP 50 PLACES)

Instructions for assembly:

AFTER DRILLING AND BENDING ASSEMBLY PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP

[illegible]

Technical drawing of a bridge deck cross-section showing two alternative hole positions. The drawing includes dimensions for hole diameter ($\varnothing 0.640$), hole offset (1.0), distance from hole to tangent point (13.4 and 32.0 ± 1.0), and overall deck width (11.0).

0.5 1.5 1.5 D

BLACK ANTI-SKID TO 0.5 ABOVE LOCATION RIDGE

BLACK ANTI-SKID TOP OF STEP TO 0.5 ABOVE BOTTOM EDGE

WELD AS PER DETAIL 8

REFER TO DETAIL C

D3566-1 D3566-5 D3566-1 D3566-13

D3564-11 D3564-5 D3564-9 D3564-13

AN3C4A BOLT (1)
AN96C10L WASHER (1)
(50 PLACES)

DESIGN	DATE	DRAWN BY	CHECKED BY

i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

SCALE

07 02 27

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

RELEASED
07-06-28

Diagram illustrating the grinding locations for the propeller cross-section. The diagram shows a cross-section of a propeller with the following labeled areas:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- LOCATION RIDGE ON UNDERSIDE OF D2576

Technical drawing of a circular component, likely a cap or cover, showing various fasteners and dimensions. The drawing includes the following labels and dimensions:

- #0.208**: Dimension for the hole diameter.
- DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)**: Instruction for drilling holes before installing the cap.
- SEAL WITH SIKAFLEX-241/-291**: Instruction for sealing the component.
- AN3-SA BOLT (1)**: Specification for one of the bolts.
- AN960JD10L WASHER (1)**: Specification for one of the washers.
- (2 PLACES)**: Indication of the number of locations for the bolts and washers.
- D2855 CAP**: Identification of the cap part.
- SEE NOTE ii)**: Reference to a note in the document.
- 0.40**: Dimension for the thickness of the component.

D2579 SPACER

D2596 WEB (REF)

AL57-1032-130 (REF)
(TYP 50 PLACES)

AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO #0.437 X 1.00 DEEP

 $\triangle C$

i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

[illegible]

Figure 1 is a plan view of the proposed road layout. It shows the alignment of the road, the location of the bridge, and the proposed road widening. The diagram includes the following dimensions and labels:

- Overall road width: 51.340m
- Bridge width: 39.580m
- Offsets from the road edge: 5.985m, 5.338m (REF), 3.630m (REF), 5.915m, 20.0m, 11.0m
- Bridge piers: 1.0m distance between hole and tangent point
- Proposed road widening: 32.0 ± 1.0m
- Labels: PLAN VIEW, PROPOSED ROAD LAYOUT

0.5

1.5

1.5

H

REFER TO DETAIL G

NO C'BORE
NO PLUG

BLACK ANTI-SKID TO 0.5
ABOVE LOCATION RIDGE

BLACK ANTI-SKID TOP OF STEP
TO 0.5 ABOVE BOTTOM EDGE

WELD AS PER DETAIL F

NO C'BORE
NO PLUG

NO C'BORE
NO PLUG

D3566-1

D3566-5

D3566-1

D3566-13

D3564-11

D3564-5

D3564-9

D3564-13


AN3C4A BOLT (1)

AN960C10L WASHER (1)

(50 PLACES)

8

wb 59028

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DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY		SCALE 1:24	

W/O:		WORK ORDER CHANGES					
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NO. 232

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliott
Job number: 58508
Part number: D205 634 041
Description: 205 tube
Welding Process: Tig[☒] Mig[]
Base material: Aluminium
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier P. J. Jones Date of Test Coupon 10.05.18
Welder Barclay Elliott Date of Test Coupon 10.05.18

The above named individual is qualified in accordance with AWS D17.1.2001 to weld